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A Lukewarm Response to Climate Change: Across Texas, teachers face obstacles to covering a politicized subject in their classrooms

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A Lukewarm Response to Climate Change: Across Texas, teachers face obstacles to covering a politicized subject in their classrooms

by

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Report

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Arts

The University of Texas at Austin

May 2019

Dedication

To my late grandfather, John P. Neu, who believed wholeheartedly in me and the possibilities that an education affords. And to my all my family – including my grandmother, Lois Neu, my parents, Joan and Robert Anchondo, and my siblings, Magdalena, Louisa and Joseph – I would not have finished this journey without your support.

Abstract

A Lukewarm Response to Climate Change: Across Texas, teachers face obstacles to covering a politicized subject in their classrooms

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Abstract: Climate change — or long-term changes in the Earth's climate — is a highly debated topic of conversation in modern society. Widely discussed in political arenas and in the media, climate change is still relatively new as a topic taught in schools. In Texas, teachers face a number of obstacles to educating their students about climate change and its impacts. These barriers include — but are not limited to — a lack of personal knowledge on the subject, a fear that they will be accused of advancing a political agenda, the complexity of the topic and a lack of state education standards around climate change. This is the environment teachers such as Nina Corley, in Galveston, and Melissa Michalak, in Helotes, navigate as they cover the highly politicized topic. These teachers, just two among thousands, each have their own approach to covering the material, but both strongly believe the subject needs to be taught.

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A LUKEWARM RESPONSE TO CLIMATE CHANGE: ACROSS TEXAS, TEACHERS FACE OBSTACLES TO COVERING A POLITICIZED SUBJECT IN THEIR CLASSROOMS

Nina Corley does not use the words “climate change” in her classroom.

It started sometime after the 2016 presidential election when Corley was mid-lecture. She had just introduced climate change as a topic when suddenly a hand flew into the air. Before Corley could go into any detail, a student looked directly at her and said, “That’s not true. The president said that’s a hoax.”

The challenge caught Corley by surprise. Chair of the science department at O’Connell College Preparatory School in Galveston, Corley had never encountered this kind of reaction in her 30 years of teaching. The student’s sureness unnerved her.

Over time, similar confrontations popped up. Students extended the argument, saying their parents did not want them learning about climate change. Corley didn’t follow up to see if they were telling the truth, but she has a sinking feeling they were. Successive challenges persuaded Corley that the words themselves had become a distraction. A limitation.

“The terminology, more than anything, is the obstacle I face in my classroom,” Corley said. “The first year I taught it, there wasn’t so much kickback. Then all of the sudden, you had a change in administration and it was a huge difference.”

And so, Corley made a decision. She would avoid or stop using the phrase altogether. The same goes for global warming. That way, she reasoned, she can continue to educate students about climate science without getting mired down by connotations. It’s simpler that way.

Corley, who touches on climate change in a variety of subjects, from aquatic science to biology, sighed as she said all this. She got into teaching to make a difference in children's lives, for the big "aha" moments when a student's face brightens in comprehension. She dislikes having to self-censor her word choice, but the alternative – not teaching her students about the realities of climate change – is unacceptable.

"I want students to know the true science," Corley said. "If I never, ever say the words, and I just teach them the science – to draw the correlations and to analyze the data – then they can see the changes and come to conclusions on their own."

In classrooms across the United States, educators like Corley are grappling with the realities of teaching climate change in the era of Donald Trump. In a harshly divided country, the topic has become a present-day litmus test, with Republicans on one side and Democrats on the other. The Republicans, under pressure to side with their president, are quick to dismiss claims that humans are contributing to a changing climate. Democrats, still smarting over Trump's choice to pull out of the Paris Climate Accords, seize on every opportunity to drag Republicans over the issue.

Proponents like Luke Metzger, director of advocacy group Environment Texas, say teaching the subject is in Texas' best interest.

"It is critical that school children today understand the challenges they are going to inherit and learn what needs to be done," Metzger said. "It's a shame this is seen as a political issue. If we're not preparing our students to understand the science, that puts people at a disadvantage. We know that young people care passionately about the environment and – if kids aren't learning about the problem – they're not going to have the opportunity to have their voices heard."

Amid this political tug of war, multiple states – like Texas – still lag behind in teaching climate science. In Texas, where state education standards barely mention the

topic, school districts have wide discretion in how the subject is covered and for what duration. Teachers are like pioneers hamstrung by maps with few signposts and various obstacles along their journey. These barriers include a lack of personal knowledge about the subject, as many received little or no climate science education during their own upbringing. They also compete with a continuous onslaught of misinformation and are careful to avoid the perception of pushing a political agenda. And, in a state where many politicians are reluctant to acknowledge or are hostile to the idea that man is contributing to climate change, teachers educating students on the subject face an uphill challenge.

Still, on top of all that, Texas is already feeling the consequences of climate change.

John Nielsen-Gammon, the Texas State Climatologist, said one of the most direct and obvious impacts is rising temperatures, with winters across the state now increasingly mild. Nielsen-Gammon, who was appointed by former president George W. Bush – then governor – to his position in 2000, said these higher temperatures could mean greater evaporation off of state reservoirs, stretching Texas' water supply even further as populations statewide continue to skyrocket.

Yet, Nielsen-Gammon, who said it's his mission "to help Texas make the best possible use of weather and climate information," has observed that long-term planning around climate change is primarily happening in Texas at the city and regional level.

"There hasn't been much of that at the state level that I've seen," said Nielsen-Gammon, who noted the state could do a better job of using the latest available information. He said cities like Austin have embraced climate predictions tailored to their circumstances to take a long-range look at the issue.

On top of higher temperatures, Nielsen-Gammon said other known impacts of climate change include more extreme rainfall events, like those that made Hurricane Harvey in 2017 especially devastating to Texas up and down its coast.

And so, as Texas becomes hotter, drier and more flood-prone every year, Texas students, who will face these challenges more acutely in the future, are leaving school with limited knowledge on the topic. In deep-red Texas, where efforts to address climate change often take a backseat to industry, it's likely that individual teachers will ultimately determine how the subject is presented.

If students listen – and how much they learn – still remains to be seen.

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To understand how education works in Texas is to understand standardized testing. Think No. 2 pencils and Scantron sheets lined with rows of perfectly aligned bubbles. If you have gone through the Texas education system sometime during the last 35 years, then this sounds all too familiar: the word problems, the multi-choice questions, the dry recitation of exam instructions before a proctor looks up, pauses and says, "You may now open your testing booklet to the first page and…begin."

Texas began its march to high-stakes testing in 1983, when Henry Ross Perot, nine years before his failed presidential bid, led the charge to overhaul Texas' education system. Perot, founder of the Electronic Data Systems corporation, was the leader of a coalition of Texas businessmen who decided it was time to bring Texas, and its pupils, into the high-tech age.

At that point, Texas had no statewide standards for each grade level, nor a statewide assessment to measure the learning taking place. Perot – ever the businessman

– sought a way to calculate what students were learning or not. He believed that a statewide system to test basic skills was the best way to bring some accountability into Texas education. Some of Perot's objectives proved so controversial – such as a no-pass, no-play rule that required students to have passing grades in order to participate in sports and extracurriculars – that a 1992 New York Times special report on the subject asked, "Visionary or Demagogue?" when describing Perot.

But the state legislature listened.

In 1984, Texas adopted one of the biggest education laws in its history – House Bill 72 – paid for by an increase in state taxes. Among multiple changes, the law was developed to make the financing of education more equitable and to make schools more accountable for students' results.

Margaret Spellings, who was the U.S. Secretary of Education under former president George W. Bush and a chief proponent of the No Child Left Behind Act of 2001, said Perot was influential given the attention he brought to the accountability in education movement. Among a national conversation by then-governor Bill Clinton and others, Perot used his "big microphone" to help jumpstart a dialogue on public education, Spellings said.

Spellings recognized that standardized testing has become "a bit of lightning rod issue," but said the alternative is no assessment and that there is nothing wrong with tracking progress and then adjusting accordingly.

"It laid a foundation that was helpful," said Spellings, referring to Perot's work on House Bill 72. "He was one of the first to the party, so I think that was important."

In every consecutive budget cycle, more and more resources have been put toward testing and accountability. In the past, the STAAR exam – the acronym means

State of Texas Assessments of Academic Readiness – has cost taxpayers as much as $90 million to administer each year.

In Texas, standardized testing has become the gold standard for evaluating a school district's performance and has made learning interchangeable with student achievement. The standards which state testing is based on are known as the TEKS – the Texas Essential Knowledge and Skills. And while the state assessment's name has changed repeatedly over time, Texas' ardor toward testing has only grown stronger.

It's this testing machine that puts climate change on the back burner. By definition, the TEKS are what every student in Texas needs to know. If something is not stressed in the TEKS, it will not appear heavily – if at all – on the test. Spellings said if people want climate change to become a priority in Texas classrooms, "you've got to put it in the standards and accountability system."

Material not included on the test is interpreted by some to be unimportant, as the state assessments are seen as a reflection of Texas' academic values.

In fact, on the 2018 biology STAAR test for high school only one of 54 questions related to climate change. Even though the term was not used in the question, the answer choices listed effects like rising ocean temperatures and global droughts.

The question read: "Scientists have observed many types of tropical fish moving beyond their traditional ocean ranges into waters that have historically been more temperate. These fish compete for food with native fish, consuming much from the kelp forests and beds of sea grass. The expansion of the ranges of tropical fish was most likely caused by —"

The answer is C - the rising temperatures of ocean waters.

Of any state assessment, the biology STAAR test is the most likely place where a question on climate change would appear.

For many students, this could be their final test of climate change knowledge before leaving high school.

One question. On one test.

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Melissa Michalak freely admits she has not always believed in climate change.

"To be quite honest, when I first heard about climate change, I thought it was a complete and utter lie," said Michalak, the only AP environmental science teacher at Sandra Day O'Connor High School in Helotes, Texas.

She was an undergraduate at Texas Lutheran when she first heard the term. Her skepticism came from growing up in Galveston, where she says there were two types of weather: hot and rainy. A few weeks of mild winter sprinkled in were the only variations. Otherwise, Michalak remembers summers there as a mix of "hot, hotter and hell."

As a public-school kid, she never learned anything about climate change and said Galveston's consistently hot temperatures wouldn't have done much to convince her. Now, however, as an AP environmental science teacher, climate change is a major chunk of Michalak's curriculum.

Michalak works for Northside Independent School District (NISD) in San Antonio – the fourth largest school district in Texas – which serves more than 105,000 students. And while she now holds a master's and a doctorate, Michalak empathizes with students struggling to grasp concepts like the difference between weather and climate. (Unlike Corley, Michalak actively uses the term climate change as she teaches).

In Texas, where the saying, "If you don't like the weather just wait five minutes" is a familiar adage, students point to rapid swings in weather – freezing temperatures at

the start of a week and blazing sun at the end – as a source of confusion. But luckily for Michalak's students, she has decent latitude from the district and devotes 10 full days to the subject. As an AP teacher, though, she has a much bigger mandate than the average Texas teacher to cover climate change.

On a cool, overcast day in late March, Michalak asked her students to stand up and form a single-file line. As they left her classroom, each student grabbed a one-gallon jug of water and followed Michalak through the hallway, down a flight of stairs and into the school courtyard. Awkwardly shifting their jugs from hand to hand, the students congregated around Michalak. She wore a teal class T-shirt from 2018 that read: "Make the Planet Great Again."

Michalak explained that in many parts of the developing world, water is still collected by hand. She asked students how much they thought the gallon weighs. Their task was to make one lap holding their jug. A male student laughed and said, "I got this!" before he took off at a sprint.

After one lap, though, Michalak stopped her students. She told them that in many cases, collecting water is considered the purview of women and girls.

"Okay. Now boys, I want you to hand your gallons to the women," Michalak instructed.

A collective groan escaped from the female students as their male peers chuckled and handed off their jugs. Michalak took another lap among the women, as they asked her questions such as: "Do the women still collect water even when they're pregnant?" Michalak answered yes.

A gentle breeze stirred up leaves, which the male students kicked at as they were rejoined by the entire group. Michalak's students headed back to the classroom.

Once there, Michalak asked how their simulation compared to what someone in a developing country might experience. Students talked about factors like a difference in footwear, how they only traveled a short distance, how their exercise was free from risk – like potential attacks – and how their one-gallon jugs, at only eight pounds, weighed far less than what people in developing countries would likely be carrying.

When Michalak asked students if the exercise caused them to empathize more with people who work harder for their water, the responses were varied. Although the lesson was predominantly about water use, Michalak used the opportunity to talk about how climate change can contribute to a scarcity of resources – like water – making these trips to collect it more time-consuming. If a drought is severe enough, Michalak said, people might even consider migrating, making the hard choice to uproot their families.

After the bell rings, Michalak said she hopes lessons like this one not only teach students about climate change and natural resources, but also about the way other people experience life.

Unlike most teachers, who cover material seen on the state's end-of-course exams, Michalak's students are tested ultimately through the College Board – the same entity which administers the SAT exam. This is a key difference. As an AP course, Michalak's curriculum is governed by the College Board's national standards – the same in all 50 states – whereas any non-AP course in Texas is guided by the TEKS.

Teachers and districts have wide latitude in their interpretation and approach to covering any given TEK. This also includes how long any individual TEK is taught, another choice left up to a district, its teachers and maybe curriculum specialists, if a district has the financial resources to employ such a person. Some districts are even able to come up with sample lesson plans, which are particularly useful for new teachers or

those who might not know too much about a topic or how to cover it. Again, not every district has the money to offer that resource.

Shelly Forsythe, an assistant professor in the Department of Curriculum and Instruction at Texas State University, educates future teachers about STEM instruction. She said some Texas school districts give pacing recommendations to teachers and do regular check-ins to monitor progress. Others prefer to give their teachers more freedom.

"Every TEK is definitely supposed to be taught, but there is wide interpretation of what a TEK means," Forsythe said. "There is also leeway around approaches, with one teacher studying a TEK through student exploration and another studying it through text-based evidence."

So often, Forsythe said, it all comes down to teacher choice. An industrious teacher could elect to pull in a connection to climate change when covering a TEK, such as the difference between weather and climate, but they are not required to do so. Teachers can cover that objective without going a step further and using the opportunity to engage students in a conversation about climate change. And, Forsythe added, there are so many TEKS and so much science that could be taught, that at some point a line has to be drawn.

It is those disparities in time or approach that ultimately open things up for the "possibility for differences in the learning outcomes," she said. In other words, depending on where they live, what school they attend and the teacher they have, Texas students will leave school with stark variations in their knowledge of climate change.

On an AP environmental science exam, questions related to climate change comprise 10 to 15 percent of the test, Michalak said. By comparison, Texas' end-of-course exams may only ask a couple of questions about the subject.

"If you're an AP environmental science teacher and you do not teach climate change, you're doing your kids an incredible disservice," Michalak said. "You are handicapping your kids."

In a state that highly prioritizes standardized testing, teachers end up teaching toward the test. The less space a topic takes up on the state test, the less sense it makes for teachers to dedicate extended time on the subject. Teachers across Texas lament how much one exam dictates what they cover, but in some part – it varies by school and district – their performance is evaluated based on how well their students score. The lower students score, the less effective the teacher.

It's in the teachers' best interests for their students to score high.

As an AP teacher, Michalak is not held to those same standards. But not every school district is able to offer an AP environmental science course. And, even if it does, the course is an elective. Students must opt in and, for many, the course's academic rigor is discouraging. Scoring well on an AP exam can exempt students from classes at college and the coursework to prepare students is proportionately difficult.

And so, while AP courses are an option, that does not mean they are right for every student. And more traditional science offerings don't cover the subject to the same degree. Not even close.

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In her classroom at O'Connor, Michalak prides herself on not telling her students what to think. In fact, she really wants them to know that she's apolitical.

"I will look at both sides because I'm not very liberal and I'm not conservative, either," said Michalak, speaking rapidly in her normal, blunt tone. "I am one of the more moderate people that probably teaches AP environmental science."

If a student tries to call climate change a hoax, Michalak has a response ready and waiting. She challenges the student, asking them to defend their position. Part of her instruction is dissecting tweets by President Trump. Is he tweeting about the Paris Climate Accords? Michalak pulls that into the day's conversation. Another tweet about ratcheting back the Environmental Protection Agency? Let's address it, Michalak said.

For example, during a bout of severe cold weather in January, Trump tweeted: "Be careful and try staying in your house. Large parts of the Country are suffering from tremendous amounts of snow and near record setting cold. Amazing how big this system is. Wouldn't be bad to have a little of that good old-fashioned Global Warming right now!"

At the same time, Michalak said the students enrolling in her class are less likely to be climate change deniers, and she hypothesized that students who believe it's a hoax will do their best to avoid the subject altogether.

Part of Michalak's unit on climate change involves the identification of propaganda or messages that may be alarmist or inaccurate. It also means analyzing films such as *An Inconvenient Truth*, Vice President Al Gore's 2006 documentary about global warming that first garnered widespread awareness about human impact on the Earth.

One tool Michalak employs is a graphic organizer, a Punnett square-like grid where students game out potential scenarios. One box asks students to consider what happens if climate change is real, if humans continue on with business as usual and make no mitigation efforts. Another box asks students to see what would happen if climate change is not real, and human behavior also goes unchanged. Still another tasks students

to examine what happens if climate change isn't as fast-paced as scientists have said, and humans do as much as possible to curb emissions.

And so on.

This is just one activity Michalak uses to make students apply the science they've been taught and to confront potential skepticism. It's also her way of dealing with the topic's political nature. Michalak goes out of her way to prove that she's not attempting to influence students politically, but many teachers – like Corley – remain intimated by its politicization and alter their delivery.

Glenn Branch, deputy director of the National Center for Science Education (NCSE), said it is common for teachers to adjust how they present socially controversial issues, with community beliefs playing a determining role.

"There is certainly a degree of hesitancy among teachers to be forthright about it because terms like global warming or climate change are perceived to be politically fraught," said Branch on the phone at NCSE headquarters in Oakland. "It's understandable, but unfortunate."

Teachers, already overworked, do not need the added stress of worrying about upset parents or riled community leaders. According a national survey by the NCSE and researchers at Penn State University, educators teaching climate change face significantly less outside pressure than their colleagues in biology, who toe a much tighter line in the creation versus evolution debate. The confidential survey looked at climate change education in the 2014–15 academic year and results were published in March 2016.

Results from the NCSE and Penn State survey – which received 1,500 responses from middle school and high school teachers – showed that while less than five percent of teachers say they experienced overt pressure not to teach about climate change, just two-thirds believe human activity is the primary cause of recent global warming.

Climate change is also a technically complex subject to teach. Many teachers reported that they don't always feel comfortable teaching a subject they don't intimately understand. And even the most well-intentioned teachers can spread misinformation this way, sometimes unaware they are actually getting the facts around climate change wrong.

What's more, the average amount of time middle school teachers spent covering recent global warming was barely over four hours.

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In December 2018, a gaggle of reporters filled the governor's public reception room on the second floor of the Texas Capitol. Antique loveseats and sitting chairs adorn the room, trimmed in sumptuous fringe and patterned fabric. Ornate dark brown molding, carved with a craftsmen's expert hand, trim the doors and tall plantation shutters.

It's a decadent room that transports the occupant to a distant chapter in Texas' past, when small talk was exchanged between the governor and the public in this space.

This past December, it was filled only with reporters and politicians who all jostled for a view of a single table in the center of the room. Governor Greg Abbott, a Republican, sat beside Texas A&M University Chancellor John Sharp as the pair unveiled an after-action report on Hurricane Harvey. The report outlined steps to prepare Texas for the next major storm and improve disaster response statewide.

Yet, it only mentioned the term climate change once. In all 175 pages. Buried deep in an endnote.

Reporters pressed Abbott on the term's absence and whether he believes in human contribution to climate change. Abbott initially dodged the question. Asked again, he hesitated before saying, "I am not a scientist."

It was a notable sidestep and the latest instance where top Texas politicians have failed to accept the scientific consensus on climate change. In January, less than a month after Abbott's pivot, a consortium of 27 climate scientists, researchers and professors – all from Texas – sent a letter to the governor offering to brief him on the latest developments in climate science and what Texas should do to reduce its emissions.

"We, the undersigned, are climate scientists and experts, and can report to you that climate change is happening, it is primarily caused by humans, and it is having a devastating impact on Texas," the letter read in part.

Despite the scientists' offer, the governor's office has provided no response.

This is the prevailing political climate in Texas, one of America's largest emitters of greenhouse gases, where Republicans control not only the governor's mansion, but the House of Representatives and the Senate as well.

James Taylor, a senior fellow for environment and energy policy at The Heartland Institute, thinks Texas has the right idea.

Taylor believes concerns about a looming climate change crisis are exaggerated and that it's risky to teach climate change in schools because of how it has become so politicized.

"The recent emphasis on teaching climate change is unnecessary and diverts time, attention and resources away from other more important educational issues," said Taylor, whose career at the conservative think tank spans nearly two decades.

In 2017, The Heartland Institute made controversial waves after it sent out more than 300,000 copies of the booklet "Why Scientists Disagree About Global Warming" to middle, high school and college science teachers across the U.S. Nina Corley – the Galveston teacher – was one of them. Groups like the National Center for Science

Education quickly condemned the materials and claimed the content was misleading because it disputed the degree to which human activity is accelerating climate change.

Two years on, Taylor shrugs off those criticisms by "the environmental left." And, although he said global warming is a theory used by leftists to "latch back onto power," Taylor added that if climate change must be taught in schools then it needs to strictly adhere to the scientific method. That includes challenging existing hypotheses, even the consensus where 97 percent of scientists agree that climate change is happening and is exacerbated by human activity.

"The global warming topic has become so politicized, and is such an emotional issue, that when skeptics and the scientists I work with challenge key components of the theory – we are branded deniers," Taylor said. "So, if climate change were taught, where whatever theory is presented the students are encouraged to find and present the best evidence on the other side as well, then it could be quite valuable."

But Taylor said teachers are unlikely to do so because they fear being branded deniers.

Yet Taylor isn't alone in wanting both sides of the debate to be taught. The official platform for the Republican Party of Texas says teachers and students should be able to discuss the strengths and weaknesses of scientific theories "openly" and "without fear of retribution or discrimination of any kind." It also stipulates that climate change "is a political agenda promoted to control every aspect of our lives."

Equally critical is the Republican dominated State Board of Education, where two-thirds of the 15 seats are occupied by conservatives. This is the body that ultimately approves standards and policies for Texas public schools, including curriculum review – like the TEKS – and adopting new instructional materials.

And while the State Board of Education has been less aggressive toward climate science than state Rep. Valoree Swanson – who introduced a bill in 2017 that aimed to protect a teacher's "academic freedom" and which many saw as a means to teach climate change denial (it never came to a vote) – the conservative board is unlikely to amend the TEKS to add more standards about climate change. In fact, in 2017, the board voted to streamline the science TEKS because it determined there were too many objectives for teachers to get through before the state test.

"They are going through a process of streamlining all of the TEKS because we have a curriculum that is a mile-wide but an inch deep," said Bryan Weatherford, a teaching and learning specialist at the Texas State Teachers Association. "They're advocating for fewer TEKS so teachers can go into more depth covering certain information."

However, there are no TEKS about climate change at the elementary level and only one TEK for middle school even mentions climate. But not climate change. If the State Board of Education amended the TEKS to add more standards on climate change – a "very political process," said Weatherford – that discussion would not start until 2023. It could be 2024 before it ended and 2025 before instructional materials and books reflected those changes.

That's according to Georgina Perez, a Democrat, who represents District 1 on the State Board of Education. She believes Texas doesn't go far enough when teaching about climate change.

"We're not even touching the surface," said Perez, who was elected to the board in 2018. "We are not close enough to adequately teaching about the seriousness of what we're going to face in having enough clean air and water, and the mass migration that will take place from long periods of drought or when people move because their land is

covered in water. We don't go far enough in talking about the things we need to do as humans."

And while the TEKS get changed through an extremely intricate review process, with input from a vast multitude of stakeholders, Perez said the political makeup of the board would likely need to change if new TEKS about climate change stand a chance of being added.

Perez is heartened by recent efforts of student activists who are sounding the alarm on climate change. But she regrets that earlier generations have forced them into a "survival mode" where they have "no choice" but to address the issue.

Advocates of teaching climate science to students say it is important for a variety of reasons. Students who understand the complexities of the issue will be better prepared to deal with its challenges. They'll be more likely to vote for politicians who are willing to make headway on green initiatives and change policy accordingly. Students who understand the effects of climate change might go into careers in alternative energy, ecology or conservation. The list goes on.

But whether or not educating students about climate change is enough to overcome political division around the issue? That's a whole other question altogether.

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Virginia Gaffney, a freshman at Austin Community College studying recreational therapy, is one of those activists. She is a leader of the Texas chapter of Youth Climate Strike – an international movement of students who walked out of their schools this spring to demand climate action.

In March, Gaffney rallied with hundreds of other Texas students at the Capitol to make her voice heard. Under towering live oaks, students arranged themselves in a semi-circle on the lawn just south of the Capitol. Gaffney took to a megaphone to encourage her fellow strikers that the time to act is now and alternative energies must be pursued.

"Texas is one of the largest exporters of crude oil and natural gas in the world, so we need also be the forefront in responsible environmental use and protection," said Gaffney, who wants state lawmakers to better protect Texas' natural resources. "We cannot be driven by money. We must be driven to survive and keep our home hospitable."

As a recent high school graduate – she did not graduate from a specific school but earned a completed transcript from the TEA – Gaffney said she learned about climate change and protection in courses such as AP environmental systems and environmental science. But for her, just having that knowledge isn't enough. That knowledge must be applied, she said, to address the problems our environment now faces. Those lessons must be put to work.

Gaffney, who has been politically involved for years, admitted the apathy of her former classmates can be frustrating. Her concern for the planet's health is like a weight she carries around her neck each day. Still, Gaffney knows that many Texas students still remain detached from this reality.

That's why Nina Corley, the science teacher in Galveston, thinks the best approach is to let her students understand climate change through data, like measuring carbon dioxide levels before and after the Industrial Revolution to assess human impact. In her experience, Corley estimates that attitudes toward climate change will likely stay the same as long as conservatives in Texas quibble over human contribution to climate

change. After all, she grew up in the heart of East Texas where – for people like her grandmother – if the president said something, "then that was the Gospel truth."

"If you're in an area that's heavily Republican, they're not going to listen to a whole lot of Democrats," Corley said. "Even if they're right."

That's why for now Corley is still not using the words climate change in her classroom. Corley believes it's more effective if students come to conclusions on climate change on their own, and that students who may have once called it a hoax might be more inclined to come around if they can see and interpret the evidence for themselves.

Corley said lab activities like analyzing carbon dioxide levels have led her students to consider their own carbon footprints and to ask questions about the individual things they can do to help the planet. Corley uses these moments to talk about the importance of carpooling or swapping a plastic water bottle for a reusable one.

These are small changes and Corley is well aware. But for her, letting students come around to climate change on their own terms is worth the wait.

In her classroom, it's better to stick to the data. Terminology only gets in the way.

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